APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,280	01/22/2001	Hawley Rising III	80398P325	2031

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EXAMINER
BOOKER, KELVIN E

ART UNIT	PAPER NUMBER
2121	6

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/767,280		RISING, HAWLEY	
	Examiner		Art Unit	
	Kelvin E Booker		2121	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,10-17 and 19* is/are rejected.

7)☒ Claim(s) *7,9,18 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,5* .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☒ Other: *Detailed Office Action* .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-6, 8, 10-17 and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by

Sahiner et al., "Interative Inversion of the Radon Transform" [hereafter Sahiner].

As per claim 1, Sahiner teaches of a method of designing a set of wavelet basis, the

method comprising:

A. constructing a neural network of arbitrary complexity using a discrete and finite

Radon transform (see page 112, paragraph two: "We have recently...the constrained region");

B. designing an input wavelet to fit a particular problem (see page 113, section Image

Reconstruction Using Wavelet Constraints, especially paragraphs one and two on page 113: "We

now consider...the constrained region");

C. feeding an input wavelet prototype designed to fit a particular problem through the

neural network and its back-propagation to produce an output (see section Iterative Image

Reconstruction Using Wavelet Constraints on pages 116-117, especially page 117, paragraph

three, "At each iteration...for comparison"); and

D. modifying an input function of the neural network using the output (see page 112, paragraph two: "We have shown...the constrained region").

As per claim 2, Sahiner teaches of a method wherein constructing the neural network comprises:

A. back-projecting the Radon transform to a point (see section *Iterative Image Reconstruction Using Wavelet Constraints* on pages 116-117, especially page 117, paragraph three, "At each iteration...for comparison"); and

B. subtracting a global average function of the point (see page 112, paragraph two: "We have shown...the constrained region").

As per claim 3, Sahiner teaches of a method wherein the global average function is dependent on the transform geometry and may be varied by varying the interconnect structure of the neural network (see page 112, paragraph two: the global function depends upon the spatial variances of the image).

As per claim 4, Sahiner teaches of a method wherein the transform is dual to the network (see page 112, paragraph two).

As per claim 5, Sahiner teaches of a method wherein the transform is weighted to a desired template function (see section *The Discretized Inverse Radon Transform*, especially paragraph one on page 112 through paragraph two on page 113: "The basic reconstruction ...Radon kernel [w]").

As per claim 6, Sahiner teaches of a method wherein modifying the input function comprises subtracting a difference between the input and the output from the input wavelet prototype and moving the input function in the opposite direction from the difference so that the

difference converges to zero (see page 112, paragraph two: "We have recently...satisfies these constraints").

As per claim 8, Sahiner teaches of a method wherein the wavelet bases are used to compress data selected from the group consisting of images, multidimensional data, or spatiotemporal data (see page 112, paragraphs one and two).

As per claims 10 and 11, the same limitations are subjected to in claim one, therefore the same rejections apply (see claim one above).

As per claims 12-17 and 19, the same limitations are subjected to in claims 1-6 and eight, respectively, therefore the same rejections apply (see claims 1-6 and eight above).

Allowable Subject Matter

3. **Claims 7, 9, 18 and 20** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter:

As per claims 7 and 18, the cited prior art fails to explicitly teach of a method and means for designing a set of wavelet basis consistent with the limitations of independent claims one and 12, respectively, wherein a central equation used for the Radon transform is selected from a group of equations consisting of a Gindikin or Bolker equation.

As per claims 9 and 20, the cited prior art fails to explicitly teach of a method and means for designing a set of wavelet basis consistent with the limitations of claims one, four and five and claims 12, 15 and 16, respectively, wherein template functions is spherical.

Conclusion

5. The following is prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

A. Calzone et al., "Video Compression by Means-Corrected Motion Compensation of Partial Quadtrees";

B. Hsung et al., "The Wavelet Transform of Higher Dimension and the Radon Transform";

C. Warrick et al., "A Wavelet Localized Radon Transform Based Detector for a Signal with Unknown Parameters";

D. Warrick et al., "Detection of Linear Teatures Using a Localized Radon Transform with a Wavelet Filter";

E. Rashid-Farrokhi et al., "Localized Wavelet Based Computerized Tomography";

F. Meir et al., "Stochastic Approximation by Neural Networks Using the Radon and Wavelet Transforms";

G. Rashid-Farrokhi et al., "Wavelet-Based Multiresolution Local Tomography";

H. Destefano et al., Wavelet Localization of the Radon Transform in Even Dimensions";

I. Olson et al., "Wavelet Localization of the Radon Transform";

J. Sahiner et al., "Iterative Inversion of the Radon Transform Using Image-Adaptive

Wavelet Constraints";

K. Takizawa et al., "Ultrasonic Tomography using Arc Focusing Beam";

L. Sahiner et al., "On the Use of Wavelets in Inverting the Radon Transform";

M. Rodenas et al., "A New Automatic Internal Wave Detection and Characterization

Method for SAR Images";

N. Sahiner et al., "Iterative Inversion of the Radon Transform Using Image-Adaptive

Wavelet Constraints";

O. Lu et al., "Directional Noise Removal from Aerial Imagery Using Wavelet X-Ray

Transform";

P. Magli et al, "A Pattern Detection and Compression Algorithm Based on the Joint

Wavelet and Radon Transform";

Q. Rising, III, U.S. Patent No 6,424,737;

R. Rising, III, U.S. Patent Application Publication No., 2001/0031100;

S. Liang et al., U.S. Patent No. 6,560,586; and

T. Allen, Jr. et al., U.S. Patent No. 6,208,982.

6. An inquiry concerning this communication or earlier communications from the examiner

should be directed to Kelvin Booker whose telephone number is (703) 308-4088. The examiner

can normally be reached on Monday-Friday from 7:00 AM-5:30 PM EST.

      If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Anil Khatri, can be reached on (703) 305-0282. The fax number for the organization

where this application or proceeding is assigned is (703) 746-7239.

      An inquiry of a general nature or relating to the status of this application proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

K.E.B.

Art Unit 2121

September 26, 2003

ANIL KHATRI
SUPERVISORY PATENT EXAMINER